Principles of Successful Software Inspections

NASA/Goddard Software Engineering Workshop

Presented by

Dennis Beeson
F/A-18 Software Development Team, Manager
Ki Solutions Consulting, Co-Founder
SEI Certified SCE Evaluator
(760) 375-3376
DDBeeson@gte.net

Tim Olson, President
World-Class Quality
Juran Institute Associate
Authorized SEI Lead Assessor
(612) 636-2234
Tim.Olson@worldnet.att.net

Objective

- Provide principles of effective software inspections derived from real-world organizations
- Example using inspection principles to benchmark:
  - Inspection process
  - Individual buy-in and commitment

Agenda

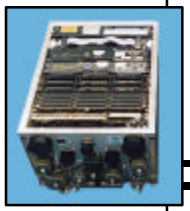
- F/A-18 Software Team Overview
- Software Inspection Principles Identified
- Benchmarking Inspection Process
- Inspection Principles and Buy-in
- Measuring People Buy-in and Commitment
- Question ????

F/A-18 Software Team Overview

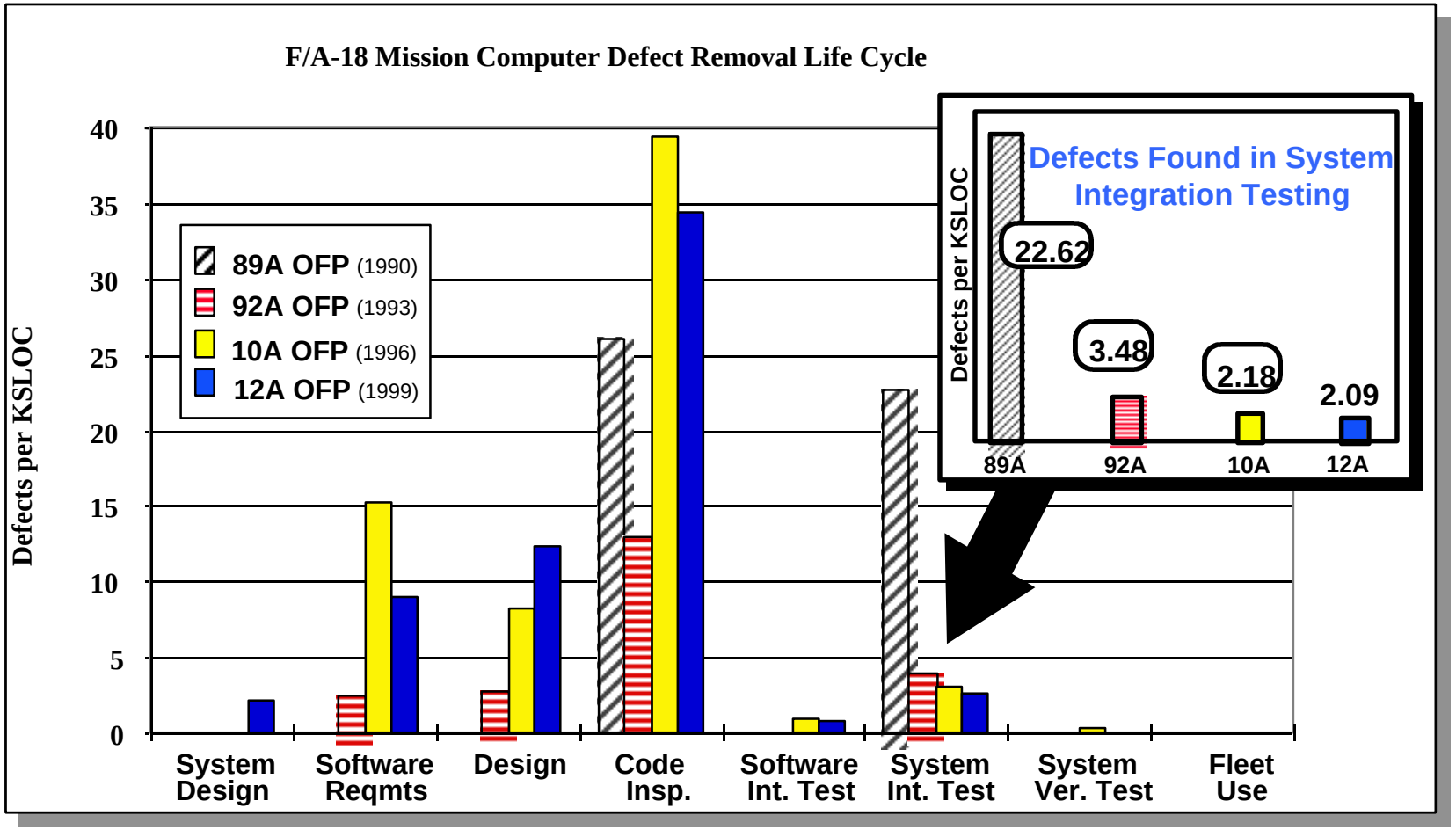
SEI CMM Level 3 rating

Measurement	World-Class Benchmark	F/A-18 Software Development Team
QUALITY		
• Inspection Defect Removal Efficiency	**80% - 90%**	**86.6%**
• Post-Release Defect Rate	**.01 per KSLOC**	**.01 per KSLOC**
COST		
• Total Cost Savings	**$ 7.5M - $ 45M**	**$14.4 Million**
• Inspection Cost	**$ 2500 on Avg.**	**$1500 on Avg.**
• Return on Investment (ROI)	**7:1 - 12:1**	**7:1**
SCHEDULE		
• Schedule / Cycle Time	**Reduced 10-25% yr**	**Reduced 9% per yr**
• Productivity	**Doubled in 3 yrs**	**Increased 62% in 3 yr**

Mission Computer

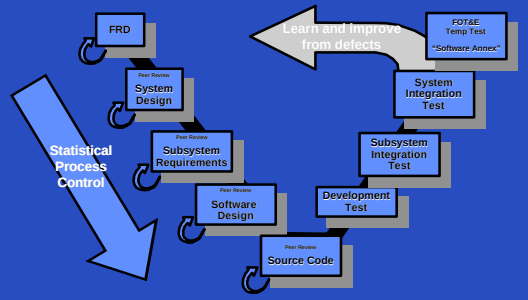


F/A-18 Software Team Performance



Focusing on software inspections has reduced product defects by 86.6%

Technology



Software Inspections and Quality

Process

SEI Software CMM

People

People CMM and Covey ...

Principles of Inspections involves: Technology, People, and Process

Principles of Software Inspections Identified

Leadership	foster, communicate, mentor, and facilitate a quality culture
Responsibility	personally identifies with quality of product
Process Ownership	willing to take on process improvement
Defect Prevention	root cause analysis of common defects for data driven checklists
Communication	facilitated meetings, environment focused on product quality
Feedback	author defects, product defect density
Defect Analysis	defect density per development phase and reinspection criteria
Agreement	agreement to plans and tasking
Defined Process	clear description of what to do when
Training	re-enforcement of what to do when and why
Defect Identification	document, categorize, and disposition defects
Accountability	reinspection criteria and moderator tracking defects to closure

Benchmarking the Inspection Process

Leadership
Responsibility
Process Ownership
Defect Prevention

- **Quality Definition**
  (e.g. Conformance to customer requirements. meeting or beating defect removal lifecycle removal curve)
- **Define, document, and train defect prevention process**

Communication
Feedback
Defect Analysis

- **Add overview meeting to educate reviewers on inspection package**
- **Insure feedback on project defect density per phase**
- **Reinspection criteria** (e.g. 10 major defects found or low preparation rate)

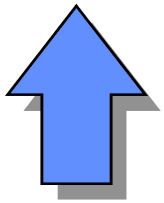
Agreement
Defined Process
Training
Defect Identification

- **Review development plan with software engineers**
- **Add moderator training stressing facilitation skills and inspection principles**
- **Update general inspection training class with inspection principles**
- **Data driven checklists to educate reviewer on common defects**

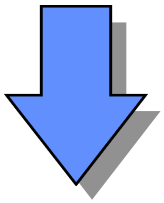
Accountability

- **Preparation rate set a 10 - 15 pages per hour**
- **Entry criteria for review material**
  (e.g. checklist of items, spell checked, clean compile)

Software Principles and Buy-in

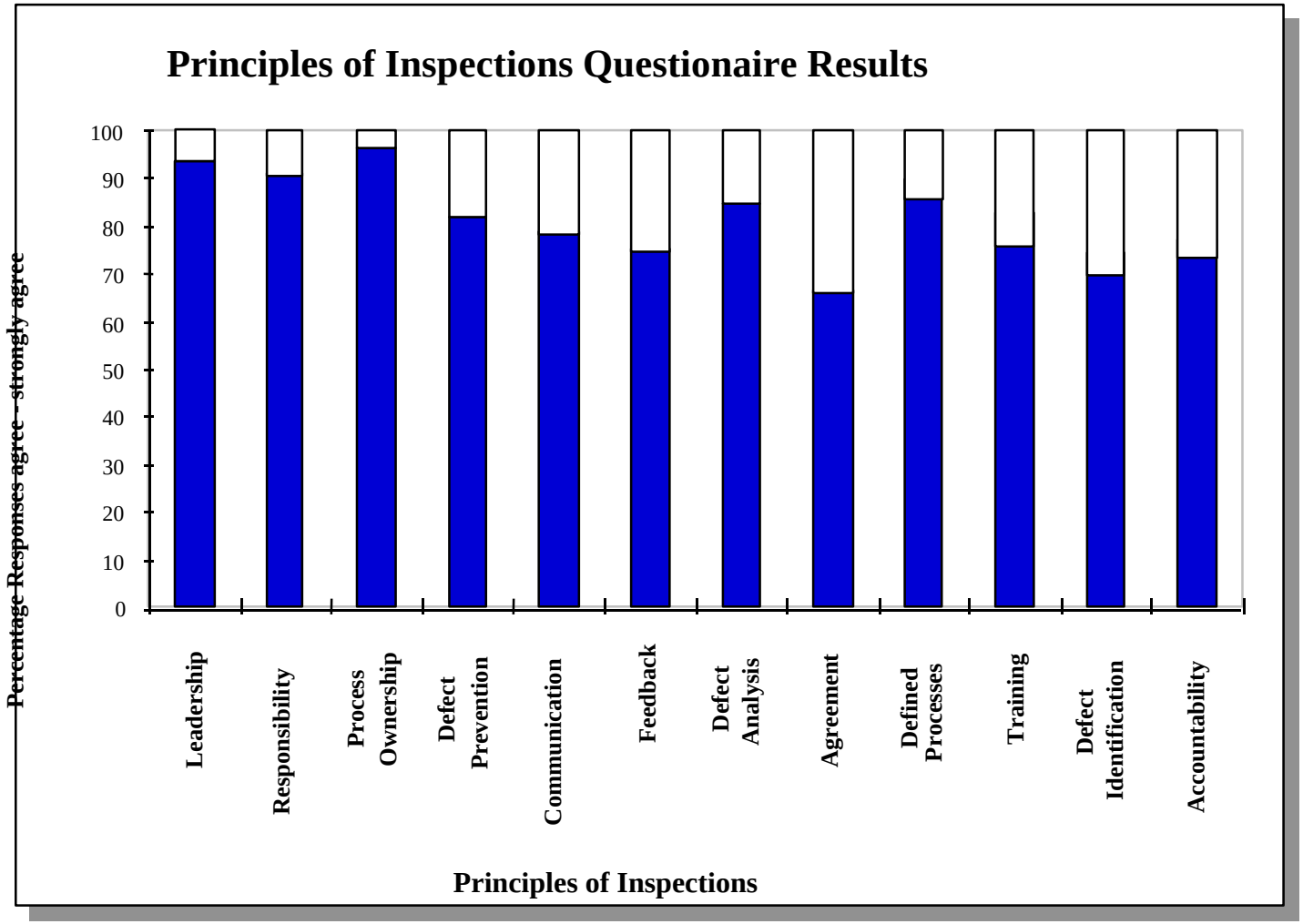


Commitment based on effective principles



Commitment	Does whatever is needed including creating new norms	
Enrollment	Does whatever can be done within the norms	
Genuine Compliance	Sees benefit, does what is expected and more	Leadership Responsibility Process Ownership Defect Prevention
Formal Compliance	Sees benefit, does what they are told	Communication Feedback Defect Analysis
Grudging Compliance	Does not see benefit, does not want to lose their job	Agreement Defined Process Training Defect Identification
Non-Compliance	Won't do it	Accountability
Apathy	Does nothing	

Measuring Peoples Buy-in and Commitment



Questions ????